

PATENT  
ATTORNEY'S DOCKET NO.: A0008/7000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Harry Zscheeg Confirmation No.: 8603  
SERIAL NO.: 09/530,003  
FILED: April 21, 2000  
FOR: EXPANDED STENT AND METHOD FOR PRODUCING SAME  
EXAMINER: Julian W. Woo  
ART UNIT: 3731

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MAIL STOP ISSUE FEE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 2220 on October 22, 2004.

  
Debra M. Doherty

MAIL STOP ISSUE FEE  
COMMISSIONER FOR PATENTS  
P. O. BOX 1450  
ALEXANDRIA, VA 22313-1450

Sir:

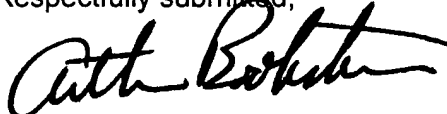
Transmitted herewith for filing is/are the following document(s):

[XX] Issue Fee Transmittal  
[XX] Response After Allowance

If the enclosed papers are considered incomplete, the Mail Room and/or the Application Branch is respectfully requested to contact the undersigned collect at (617) 261-3100, Boston, Massachusetts.

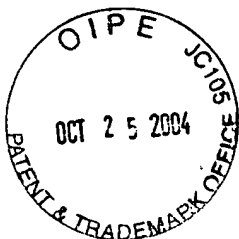
A check in the amount of \$1,385.00 is enclosed to cover the filing fee. If the fee is insufficient, the balance may be charged to the account of the undersigned, Deposit Account No. 50-1721. A duplicate of this sheet is enclosed.

Respectfully submitted,



Arthur Z. Bookstein  
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ATTORNEY DOCKET NO.: A0008/7000  
DATE: OCTOBER 22, 2004



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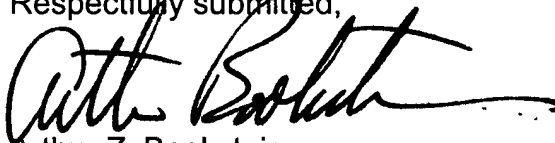
RESPONSE AFTER ALLOWANCE

Sir:

This is in response to the notice of allowance of July 27, 2004.

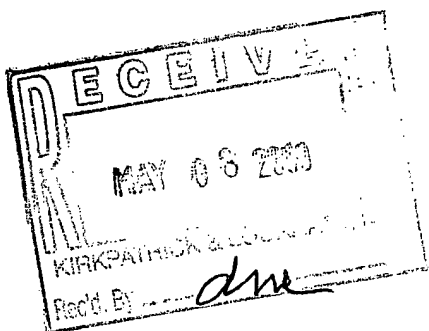
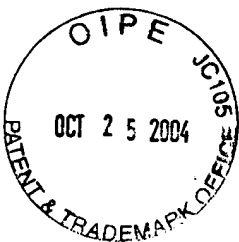
Applicant requested in a preliminary amendment filed April 21, 2000 that the title of this application be amended. A copy of that amendment is enclosed. The Notice of Allowance does not reflect that amendment to the title. Correction is requested.

Respectfully submitted,



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75 State Street  
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Customer No.: 022832  
Tel: 617-261-3100  
Attorneys for Applicant

Attorney Docket No.: A0008/7000  
Date: October 22, 2004



520 Rec'd PGT/PTO

21 APR 2000

Serial No.

File No.

008/17000

By:

JFP/DMC

Title:

EXPANDED STENT + A METHOD FOR PRODUCING SAME

Application of

Harry Zschee

09/530003

The following, DUE \_\_\_\_\_ in the U.S. PTO, was received in the PTO Mail Room on the date stamped hereon.

☒ Cert. of Mailing by Express Mail (37 CFR 1.10)

Express Mail Label No. EL50181364505

☐ Inf. Discl. Statement, PTO Form 1449 and

☐ Cert. of Mailing under 37 CFR 1.8 (a)

References Cited

☐ Application for Patent Incl. \_\_\_\_\_ pages,

☐ PCT Request 101 (\_\_\_\_\_ sheets)

( pgs) Specification, ( pgs) Abstract,

☐ Chapter II Demand

( pgs) Claims (\_\_\_\_\_ # claims)

☐ PCT Fee/Calculation/Authorization Sheet

☐ Affidavit or ☒ Declaration/Oath

☐ Certificate of Service

☐ Design Patent Application & Declaration/Oath

☐ Check for \$ \_\_\_\_\_

☐ Drawings \_\_\_\_\_ Sheet(s) (Figs. \_\_\_\_\_)

☐ Check # \_\_\_\_\_

☐ Formal or ☐ Informal drawings

☒ Amendment - PRELIMINARY

☐ Multiple Dependent Claim Fee Sheet

☐ Letter to Official Draftsman

☐ Priority Document(s) # \_\_\_\_\_

☐ Declaration w/copy of notice to File Missing Parts

☐ Verified Statement to establish small

☐ Notice of Appeal

☒ Assignment + PTO FORM 1595

☐ Power of Attorney

☐ Req. for Filing ☐ Cont. ☐ Div. Appln.

☐ Motion/Opposition/Reply.

under 37 CFR 1.60

☐ Brief (\_\_\_\_\_ x3)

☐ File Wrapper Contin (FWC) under 37 CFR 1.62

☐ Issue Fee Transmittal

☐ Petition for Ext. of Time (x2)

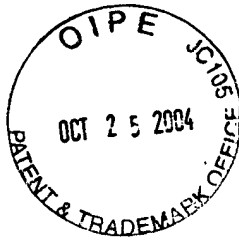
☐ Transmittal Letter (x2)

☒ Other

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35 USC 371  
MAILED 4-21-00  
OJ TRANSLATION OF APPLN INTO ENGLISH

COPY



ATTORNEY'S DOCKET NO.: PATENT  
B0410/7264

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Harry Zscheeg  
INT'L. APPLN. NO.: PCT/EP98/06717  
IN'TL. FILING DATE: 22 October 1998  
SERIAL NO.: -----  
FILED: Herewith  
FOR: EXPANDED SPREADER AND A METHOD FOR  
PRODUCING SAME

**COPY**

Box PCT  
Assistant Commissioner for Patents  
Washington, DC 20231

**PRELIMINARY AMENDMENT PURSUANT TO 37 CFR §1.121**

Sir:

This preliminary amendment is being filed contemporaneously with the national stage filing under 35 U.S.C. §371 of International Patent Application No. PCT/EP98/06717. Entry of the amendments presented below is requested.

**TITLE**

Change the title of the application from "EXPANDED SPREADER AND A METHOD FOR PRODUCING SAME" to -EXPANDED STENT AND A METHOD FOR PRODUCING SAME--.

**DRAWINGS**

Please amend the drawings as indicated in red on the replacement drawing sheet.

## CLAIMS

1. (Amended) An expandable stent, [including]  
an elastic tubular lattice structure having a first end zone [(14)], a second end zone [(16)], a longitudinal direction [(L)] and a radial direction,  
the lattice structure defining an outer diameter and an inner lumen and being formed by wall segments, which wall segments branch off at intersections [(20)],  
and  
the lattice structure being interrupted at least some of the intersections [(22)], so as to increase the flexibility of the stent, wherein the wall segments [(24)] are expanded in the radial direction at least at the interrupted intersections [in the radial direction] such that, upon curvature of the stent along the longitudinal direction, a reduction of the inner lumen due to the wall segments at the interrupted intersections is prevented.

Cancel Claim 2

3. (Amended) A stent in accordance with [at least one of the preceding claims] claim 1, wherein the expansion of the wall segments is formed by an arcuate curvature of these wall segments along the longitudinal direction.
4. (Amended) A stent in accordance with [at least one of the preceding claims] claim 1 or 2, wherein the wall segments are interrupted in regular distribution over the stent at substantially two thirds of all the intersections.
5. (Amended) A stent in accordance with [at least one of the preceding claims] claim 1, wherein the lattice structure has [in the expanded state of the stent] apertures having an aperture width of maximally 9 mm when the stent is expanded.

6. (Amended) A stent in accordance with [at least one of the preceding claims] claim 1, wherein the wall cents have a width between 0.12 mm and 0.17 mm.
7. (Amended) A stent in accordance with [at least one of the preceding claims] claim 1, wherein the lattice structure has substantially a wall thickness of between 0.2 mm and 0.3 mm.
8. (Amended) A stent in accordance with at least one of [the preceding] claims 1-7, wherein the stent consists of a metallic material.
9. (Amended) A stent in accordance with claim 8, wherein the metallic material consists of a shape memory alloy.

Cancel claims 14-18

19. (Amended) A process in accordance with [at least one of claims 12 to 18] claim 12, wherein interrupting the intersections takes place in the step of slotting.
20. (Amended) A process in accordance with [at least one of claims 12 to 19] claim 12, wherein the steps of slotting are carried out by laser cutting.
21. (Amended) A process in accordance with claim 12, wherein the step of expanding [**includes**] comprises the following partial steps:  
  
placing the stent on a mandrel, the mandrel being designed as a counter-part to the expanded shape of the stent;  
  
heating the stent placed on the mandrel;  
  
cooling the heated stent

removing the stent after cooling from the mandrel.

Cancel claims 23-26.

Add the following new claims:

27. A combination of an expandable stent and a stent delivery system wherein:  
the stent comprises an elastic tubular lattice structure having a first end zone, a second end zone, a longitudinal direction and a radial direction, the lattice structure defining an outer diameter and an inner lumen and being formed by wall segments, which wall segments branch off at intersections, and the lattice structure being interrupted at least some of the intersections, so as to increase the flexibility of the stent, wherein the wall segments are expanded in the radial direction at least at the interrupted intersections such that, upon curvature of the stent along the longitudinal direction, a reduction of the inner lumen due to the wall segments at the interrupted intersections is prevented.
28. A combination in accordance with claim 27, wherein the delivery system contains a balloon dilation catheter.
29. A combination in accordance with claim 27, wherein the application system is a system in accordance with the Seldinger technique for catheterization of bodily vessels.
30. A process in accordance with claim 27, wherein the stent consists of a metallic material made from a shape memory alloy having the following alloy moieties:
  - nickel: 54.5 to 57 mass percent,
  - titanium: 43 to 45.5 mass percent.
31. A production process for a stent, comprising the following steps:

providing a tubular element with an external diameter, and inner lumen, a first end zone and a second end zone;  
slotting the tubular element into a lattice structure, the lattice structure being formed by wall segments, which wall segments branch off at intersections;  
interrupting at least some of the intersections at selected positions, so as to increase the flexibility of the stent;  
expanding the wall segments in the radial direction at least at the interrupted intersections and at least one of said first and second end zones such that, upon curvature of the stent along the longitudinal direction, a reduction of the inner lumen due to the wall segments at the interrupted intersections is prevented.

32. process in accordance with claim 31, wherein the step of expanding includes expanding the wall segments in the radial direction in the first and second end zones.
33. A process in accordance with claim 31, wherein interrupting the intersections takes place in the step of slotting.
34. A process in accordance with claim 31, wherein the steps of slotting are carried out by laser cutting.
35. A process in accordance with claim 31, wherein the step of expanding further comprises:  
placing the stent on a mandrel, the mandrel being designed as a counter-part to the expanded shape of the stent;  
heating the stent placed on the mandrel;  
cooling the heated stent;  
removing the stent after cooling from the mandrel.



36. A process in accordance with claim 35, wherein the step of expanding further comprises:  
after cooling the heated stent,  
  
placing a mold element externally over the mandrel and the stent, which element corresponds in its contour to the expanded shape of the stent.
37. A process in accordance with claim 31, wherein the stent consists of a metallic material made from a shape memory alloy having the following alloy moieties:
- nickel.: 54.5 to 57 mass percent,
  - titanium: 43 to 45.5 mass percent.
38. A process in accordance with claim 12 wherein the tubular element comprises a metallic material.
39. A process in accordance with claim 38, in which the metallic material is provided with a dislocation threshold temperature, and wherein the step of expanding includes the following partial steps:  
placing the stent on a mandrel, the mandrel being designed as a counter-part to the expanded shape of the stent;  
heating the stent placed on the mandrel to a temperature above the dislocation threshold temperature;  
cooling the heated stent to a temperature below the dislocation threshold temperature;  
removing the stent after cooling from the mandrel.
40. A process in accordance with claim 39, further comprising:  
after cooling the heated stent, placing a mold element externally over the mandrel and the stent, which element corresponds in its contour to the expanded shape of the stent.

41. A process in accordance with claim 38, wherein the metallic material is made from a shape memory alloy having the following alloy moieties:
- nickel: 54.5 to 57 mass percent,
  - titanium 43 to 45.5 mass percent.
42. A process in accordance with claim 38, wherein the process provides in the step of expanding the wall segments or after this step, heat treatment of the stent, so as to achieve a temperature reactive shape memory effect in the zone of the expanded wall segments.
43. A process in accordance with claim 38, wherein the process further includes between the steps of slotting the tubular element and interrupting the intersections, a step of influencing the structure of the metal lattice of the stent.
44. A process in accordance with claim 38, wherein the process before the step of interrupting the intersections further includes a step of heat treatment, in order to achieve a temperature reactive shape memory effect in the entire stent region.
45. A process in accordance with claim 38, wherein the process further includes a final step of polishing the stent.

### **REMARKS**

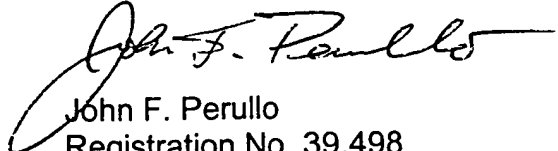
The present application is a national stage application under 35 U.S.C. §371. This preliminary amendment is being filed to place the application in proper form under the rules of U.S. patent practice and to address other minor issues of form as set forth below.

The title has been corrected to identify the invention as pertaining to a stent. The title appearing on the published international application: Expanded "Spreader" ... appears to be in error.

The drawings have been corrected to remove German language captions in

FIGS. 1 and 2. The claims have been amended to remove reference numerals and to place them in better form under the rules of U.S. patent practice. Additionally, claims 2, 14-18 and 23-26 have been cancelled and new claims 27-45 have been added to further define the applicant's contribution to the art.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John F. Perullo", is written over the typed name.

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Attorneys for Applicant

Docket No.: A0008/7000  
Date: April 21, 2000



1/4

FIG. 1

~~(Stand der Technik)~~

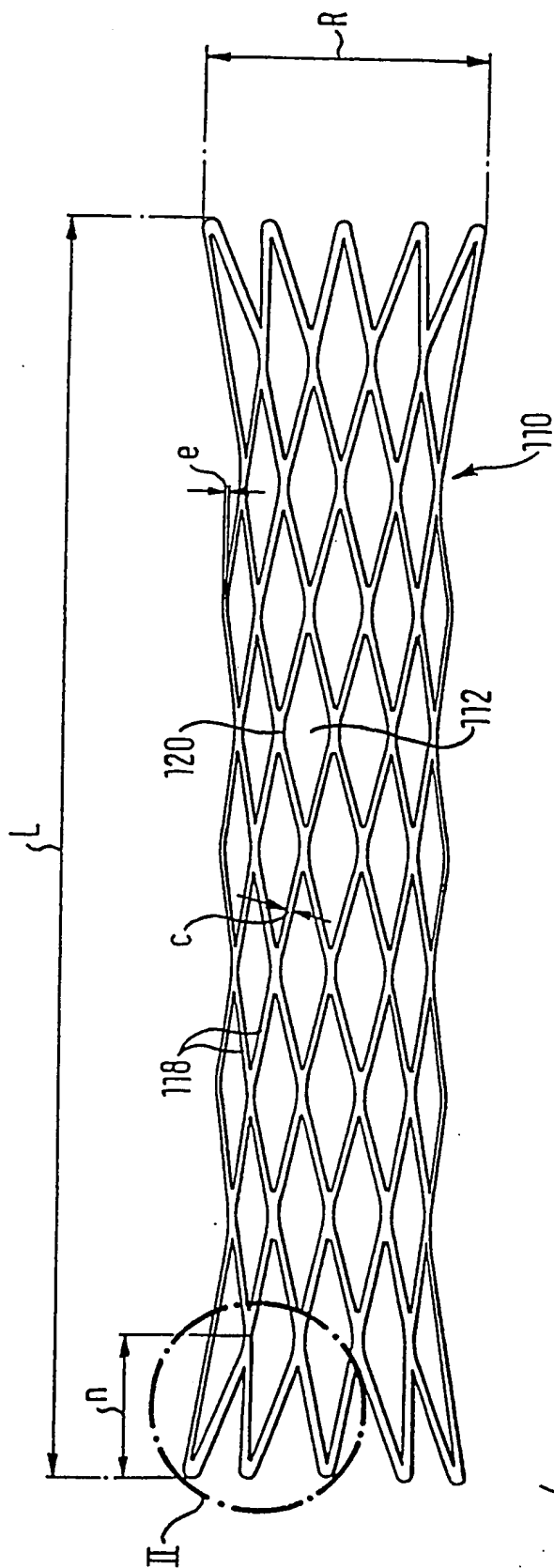


FIG. 2

~~(Stand der Technik)~~

